# UNITED STATES PATENT AND TRADEMARK OFFICE

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| 10/814,374 | 03/30/2004 | Ramesh V. Peri | 1020.P18414 | 5495 |

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| EXAMINER |
|---|
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| 2193 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

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| | Application No. | Applicant(s) |
| **Office Action Summary** | 10/814,374 | PERI ET AL. |
| | Examiner | Art Unit |
| | Insun Kang | 2193 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1) ☒ Responsive to communication(s) filed on <u>26 April 2004 and 30 March 2004</u>.

2a) ☐ This action is **FINAL**.          2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4) ☒ Claim(s) <u>1-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-20</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

## Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>30 March 2004</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All    b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>4/26/2004</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

## DETAILED ACTION

1.  This action is responding to application papers dated on 4/26/2004 and 3/30/2004.

2.  Claims 1-20 are pending in the application.

### *Specification*

3.      Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;
(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract does not contain a concise statement of the technical disclosure of the invention.

### *Drawings*

4.      Figure 1 should be designated by a legend such as --Prior Art-- because only that which is

old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR

1.121(d) are required in reply to the Office action to avoid abandonment of the application. The

replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Claim Objections*

5.      Claim 9 is objected to because of the following informalities: "a operation" should be corrected to "an operation." Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

6.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7.      Claims 1-8, 11, 13-15, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ball et al. ("Efficient Path Profiling," IEEE, pages 1-12, 1996) hereafter Ball.

Per claim 1:

Ball discloses:

-      generating a trace for a subset of program instructions formed from a set of program instructions, with said trace comprising a path identifier value, start address, and end address (i.e. "The path profiling algorithm first labels edges in a DAG with integer

values, such that each path from the entry to the exit of the DAG produces a unique

sum of the edge values along that path," page 4, right col., second paragraph) ;

- storing said trace in a trace buffer (i.e. "a trace buffer that records branch outcomes,"

page 4, left col., second paragraph);

- retrieving said trace from said trace buffer and reproducing said subset of program

instructions using said trace (i.e. "To recreate a path profile from the path counters

recorded at run time, it is necessary to map from integer representing a path to the

path itself...the reconstructed path," page 6, right col., 3.5 Regenerating a Path

section, lines 1-11).


Per claim 2:

Ball further discloses:

-receiving an endpoint program instruction for said subset of program instructions

(i.e., page 2, right col., lines 6-9);

- generating said path identifier value and end address for said subset of program

instructions (i.e. page 2, right col., lines 10-13);

- retrieving said start address from a program counter register (i.e. page 2, right col.,

second paragraph lines 1-6)

generating said trace using said path identifier value, start address and end address (i.e.

page 5, left col., section 3.2 Compactly Representing Paths with Sums, lines 1-6).


Per claim 3:

Ball further discloses:

- initializing a path identifier register, with said path identifier register to store said end
address and said path identifier value (i.e. page 6, section 3.4 Instrumentation, second
paragraph)

- assigning each unconditional branch instruction for said set of program instructions
an unconditional partial path value and an unconditional offset value (i.e. page 3, left
col., third paragraph, lines 8-12)

- and assigning each conditional branch instruction for said set of program instructions
a taken branch partial path value, an untaken branch partial path value, and a
conditional offset value (i.e. page 2, right col., first paragraph, lines 5-8, 14-15).

Per claim 4:

Ball further discloses:

- receiving a branch and determining whether said branch instruction is a conditional
branch instruction or unconditional branch instruction (i.e. page 2, right col., first
paragraph, lines 5-8)

- incrementing said path identifier value with said unconditional partial path value and
said end address with said unconditional offset value if said branch instruction is an
unconditional branch instruction (i.e. page 6, section 3.4 Instrumentation, second
paragraph; page 2, Figure 2)

- incrementing said path identifier value with said taken branch partial path value and
said end address with said conditional offset value if said branch instruction is a

conditional branch instruction that was taken; and incrementing said path identifier

value with said untaken branch partial path value and said end address with said

conditional offset value if said branch instruction is a conditional branch instruction

that was untaken (i.e. "Taking a conditional branch narrows the set of potential paths

and corresponds to a transition to a new state," page 2, right col., lines 5-6; "At the

end of the loop body...register r holds the index to increment an array of counters,"

page 2, right col., second paragraph lines 3-6).


Per claim 5:

Ball further discloses:

- comprising initializing said path identifier register prior to processing another

conditional branch instruction (i.e. "initializing path register r[r=0] in the ENTRY

vertex," page 6, right col., 3.4 Instrumentation, second paragraph, lines 2-3).


Per claim 6:

Ball further discloses:

-said subset of program instructions comprises a function (i.e. "the execution of a local

portion of a program, such as routine," pages 1, right col., paragraph 1).


Per claim 7:

Ball further discloses:

- wherein said path identifier and end address each comprise 32 bits (i.e. "the states can be represented as 32-bit integers," page 3 right col., section 1.3, second paragraph, line 9).

Per claim 8:

Ball further discloses:

- wherein said conditional branch instruction and said unconditional branch instruction each comprise 32 bits (i.e. "the states can be represented as 32-bit integers," page 3 right col., section 1.3, second paragraph, line 9).

Per claims 11 and 13, they are the apparatus versions of claim 1, respectively, and are rejected for the same reasons set forth in connection with the rejection of claim 1 above.

Per claim 14:

Ball discloses:

- a path identifier register (i.e. page 8, section 5.1 Registers, "a local register...to hold the current path," lines 1-4)

- a program counter register (i.e. counter, page 6, left col., 3.4 Instrumentation, second paragraph, line 5)

- and a path identifier generator operatively coupled to said path identifier register and said program counter register, said path identifier generator to receive an endpoint

program instruction for said subset of program instructions, to generate said path

identifier value and end address for said subset of program instructions using said

path identifier register, to retrieve said start address from a program counter register,

and generate said trace using said path identifier value, start address and end address

(i.e. "initializing path register r[r=0] in the ENTRY vertex," page 6, right col., 3.4

Instrumentation, second paragraph, lines 2-3; page 5, left col., section 3.2 Compactly

Representing Paths with Sums, lines 1-6; page 2, right col., lines 10-13).

Per claims 15, 17, and 18, they are the wireless system versions of claims 11, 13, and 14,

respectively, and are rejected for the same reasons set forth in connection with the rejection of

claims 11, 13, and 14 above.

Per claims 19 and 20 they are another method versions of claims 11, 13, and 14,

respectively, and are rejected for the same reasons set forth in connection with the rejection of

claims 11, 13, and 14 above.

8.      Claims 9, 10, 12, and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Ball

et al. ("Efficient Path Profiling," IEEE, pages 1-12, 1996) hereafter Ball in view of Mann (US

Patent 6,094,729).

Per claim 9:

Ball does not explicitly teach that said conditional branch instruction and said unconditional branch instruction further comprise an operation code value to identify a type of instruction. However, Mann teaches such an operation code value was known in the pertinent art, at the time applicant's invention was made, to indicate the data type (i.e. col. 3 lines 3-9). It would have been obvious for one having ordinary skill in the art to modify Ball's disclosed system to incorporate the teachings of Mann. The modification would be obvious because one having ordinary skill in the art would be motivated to indicate the data type to identify different types of instructions fast (i.e. col. 3 lines 3-9).

Per claim 10:

Ball discloses that said trace buffer comprises N entries (i.e. "a trace buffer that records branch outcomes," page 4, left col., second paragraph). Ball does not explicitly teach moving traces from said trace buffer to another storage location after storing N entries. However, Mann teaches it was known in the pertinent art, at the time applicant's invention was made, to move trace data into another storage if desired (i.e. col. 24 lines 5-15). It would have been obvious for one having ordinary skill in the art to modify Ball's disclosed system to incorporate the teachings of Mann. The modification would be obvious because one having ordinary skill in the art would be motivated to move the trace data into memory when the trace buffer is not available for storing the traces (i.e. col. 24 lines 5-15).

Per claim 12, this claim is the apparatus version of the claimed method discussed in claim 10, wherein all claim limitation also have been addressed and/or covered in cited areas as set forth the above.

Per claim 16, this claim is the system version of the claimed method discussed in claim

10, wherein all claim limitations also have been addressed and/or covered in cited areas as set

forth the above.

9.     Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The

examiner can normally be reached on M-F 8:30-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, MENG AI AN can be reached on 571-272-3756. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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